



## **WATER RESOURCES RESEARCH GRANT PROPOSAL**

**Project ID:** MI3061

**Title:** Watershed Based Optimization Approach for Identification and Management of Non-Point Source Pollution

**Focus Categories:** Water Quality, Law, Institutions, and Policy

**Keywords:** BMP maintenance, adoption, acceptance, stakeholders, policy analysis, water quality, watershed management, nonpoint source, Hydrologic models

**Start Date:** 03/01/2001

**End Date:** 02/28/2002

**Federal Funds:** \$4,968

**Non-Federal Matching Funds:** \$11,598

**Congressional District:** 8

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**Abstract**

Critical Regional or State Water Problems: Area of Relevant Research- Agricultural NPS pollution was identified as the major threat to the Nation's water quality in the 1992 Clean Water Act Amendment. Many efforts have been initialized to reduce the agricultural NPS pollution; however, EPA still reported NPS as the primary source for impaired streams and lakes. The Michigan Department of Environmental Quality (MDEQ) identified hundreds of watersheds that had NPS pollution problems in early 1998. These watersheds will need a "watershed performance based plan" not only to address NPS pollution problems but also to implement solutions that will optimally reduce the NPS pollution. The research will address both environmental and economic issues in NPS pollution management.

Results or benefits: With EPA's emphasis on watershed and total maximum daily loading (TMDL), watershed planners critically need a systematic economic/environmental watershed NPS pollution optimization approach. The selected study area is the Stony Creek watershed, which is one of the NPS problem (303d) watersheds identified by the MDEQ. The watershed covers 115,000 acres of land and approximately 85% of the watershed is agriculture. The final research result is a user-friendly performance based NPS watershed management system for the Stony Creek watershed. This NPS watershed management-planning tool can serve as the guidance or strategy for the watershed communities to meet both environmental and economic goals in the NPS pollution management. However, several intermittent outcomes can also be expected. First, the methodology itself will demonstrate a solid scientific-based approach for NPS pollution management. Secondly, the investigation of the cost-effectiveness of alternative Best Management Practices (BMP's) can generate knowledge to help facilitate scenario analysis for NPS pollution management assessment. Finally, the watershed experience can be applied to other watersheds that have NPS pollution problems. We have developed and applied several components for the

NPS pollution management and planning tool, including web-based Revised Universal Soil Loss Equation (RUSLE) and buffer strip design using Geographic Information System (GIS).